

(12) **United States Patent**  
**Graves et al.**(10) **Patent No.:** **US 7,578,439 B2**(45) **Date of Patent:** **Aug. 25, 2009**(54) **SYSTEM AND METHOD FOR AUTHORIZING  
STORED VALUE CARD TRANSACTIONS**(75) Inventors: **Phillip Craig Graves**, Atlanta, GA (US);  
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U.S.C. 154(b) by 288 days.(21) Appl. No.: **11/691,766**(22) Filed: **Mar. 27, 2007**(65) **Prior Publication Data**

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filed on Sep. 5, 2003, which is a continuation-in-part of  
application No. 10/411,971, filed on Apr. 11, 2003,  
now Pat. No. 7,083,084, which is a continuation of  
application No. 09/641,363, filed on Aug. 18, 2000,  
now Pat. No. 6,575,361.(60) Provisional application No. 60/149,740, filed on Aug.  
19, 1999.(51) **Int. Cl.**  
**G06K 5/00** (2006.01)(52) **U.S. Cl.** ..... **235/380; 705/14**(58) **Field of Classification Search** ..... **235/380;**  
**705/14**

See application file for complete search history.

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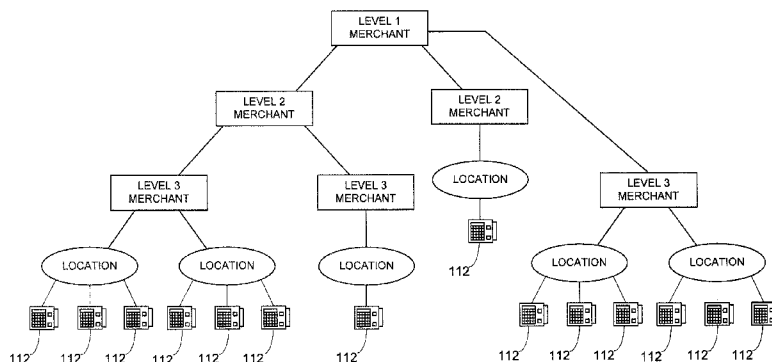
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*Primary Examiner*—Allyson N Trail(74) *Attorney, Agent, or Firm*—Hunton & Williams LLP(57) **ABSTRACT**

A computer-implemented method for processing a stored-value card transaction request in a card data management system is presented. The management system has a central processor in communication with one or more point-of-sale terminals over a communications network. Each terminal has a unique terminal identifier and is associated with a location and a prepaid card merchant. The central processor is in communication with a database having stored therein a plurality of card records. Each of these card records contains data associated with a stored-value card distributed to a prepaid card merchant for further distribution to purchasers at a location controlled by the prepaid card merchant. The transaction request comprises a requesting terminal identifier, a card identifier assigned to a stored value card, and information indicative of a requested transaction type. The method further comprises determining if the requesting terminal is authorized to request the requested transaction type for the stored value card.

**29 Claims, 9 Drawing Sheets**

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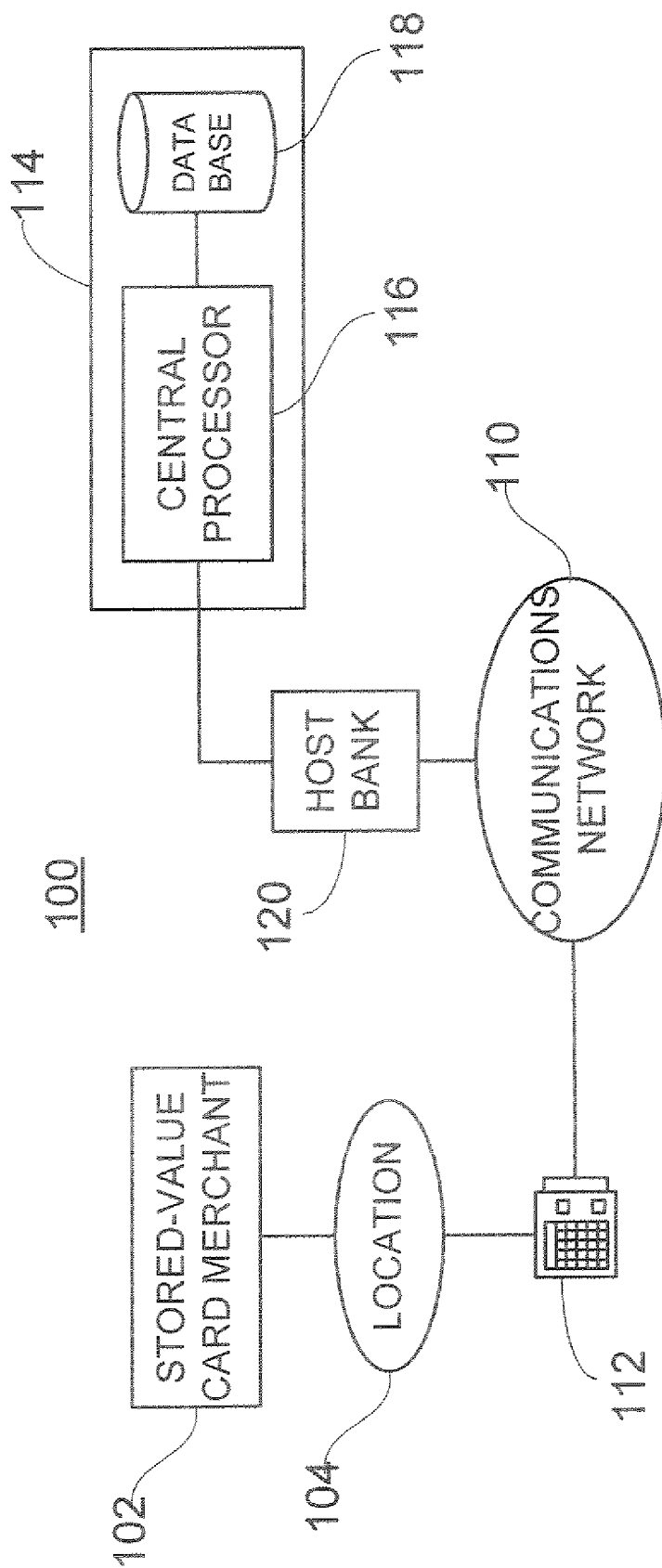


FIG. 1

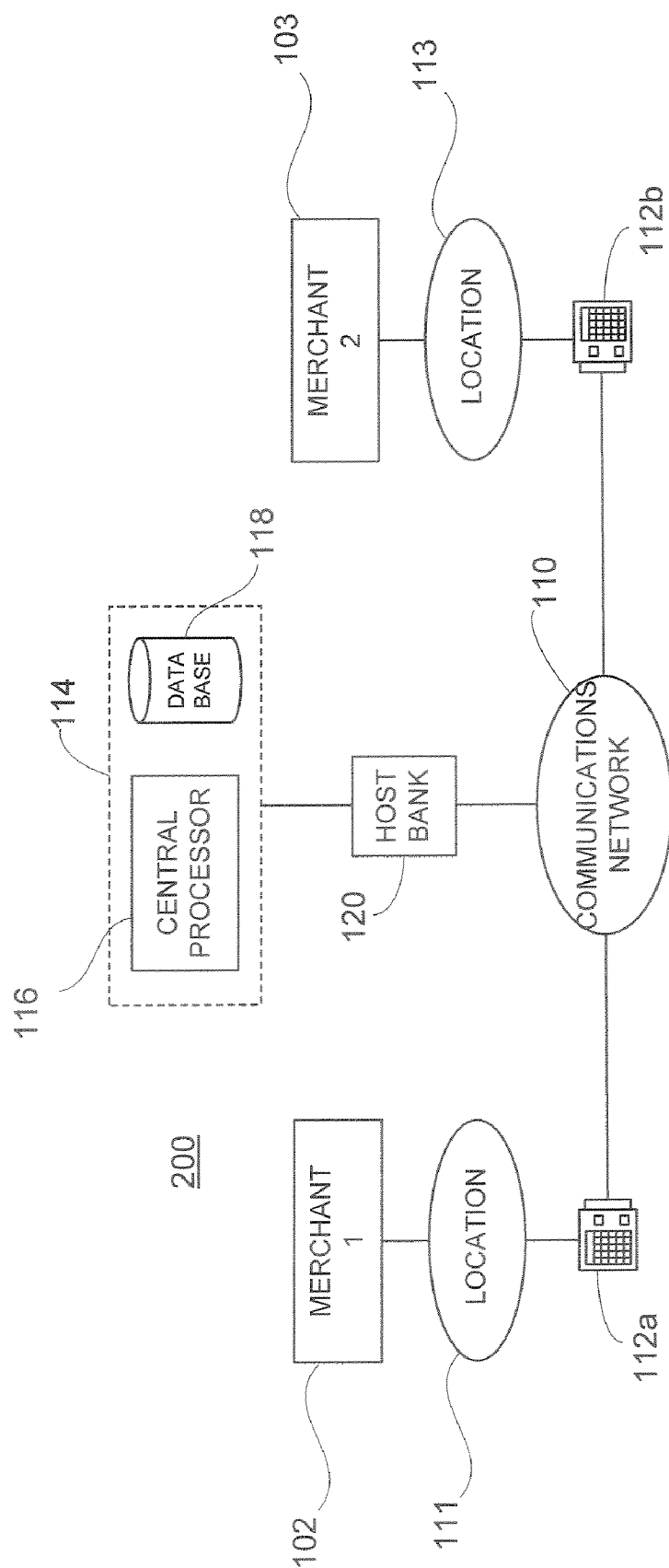


FIG. 2

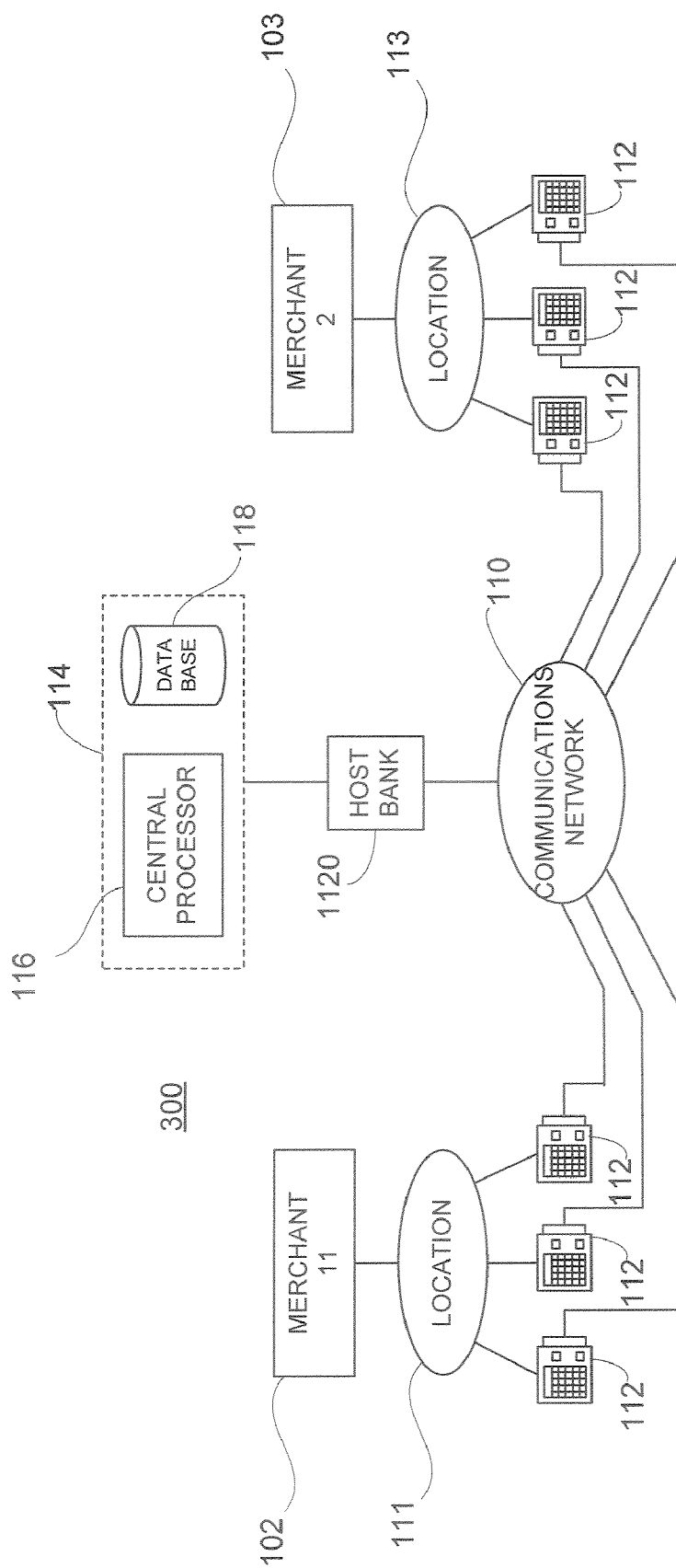


FIG. 3

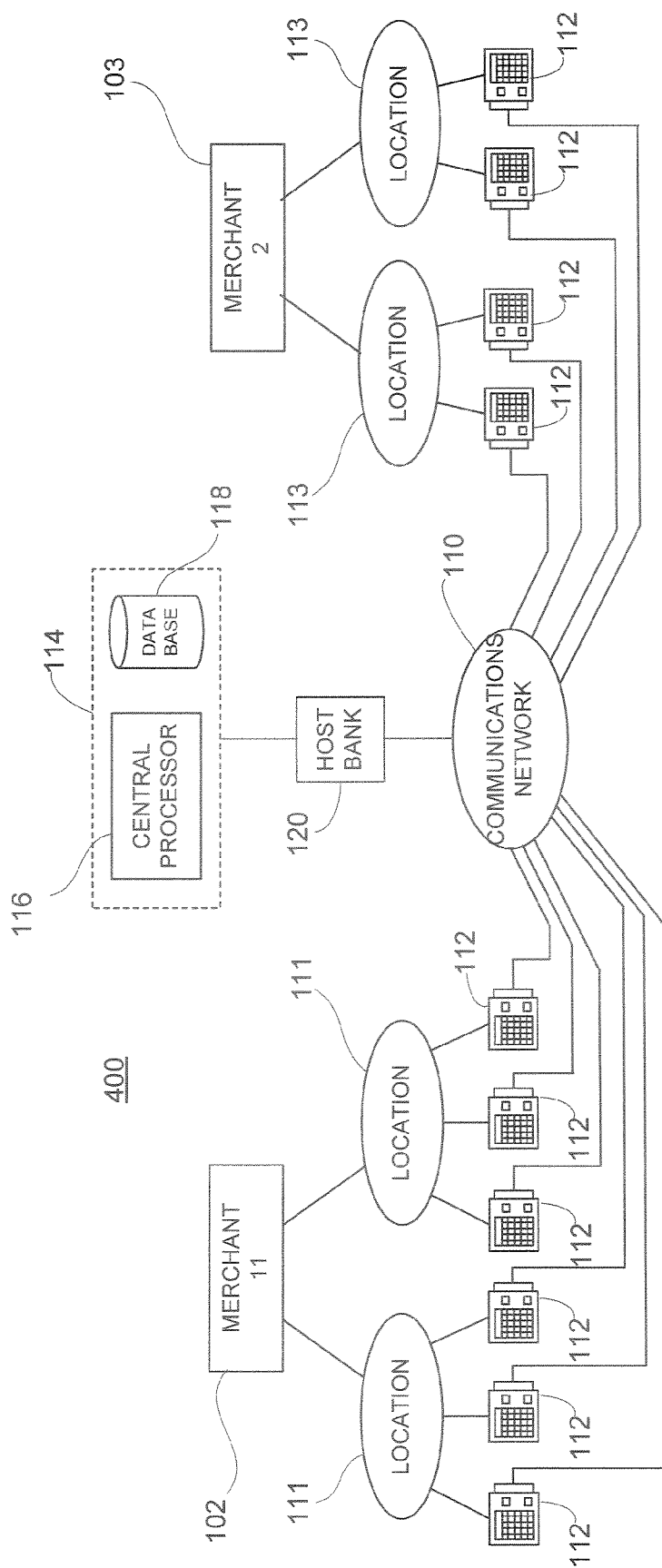


FIG. 4

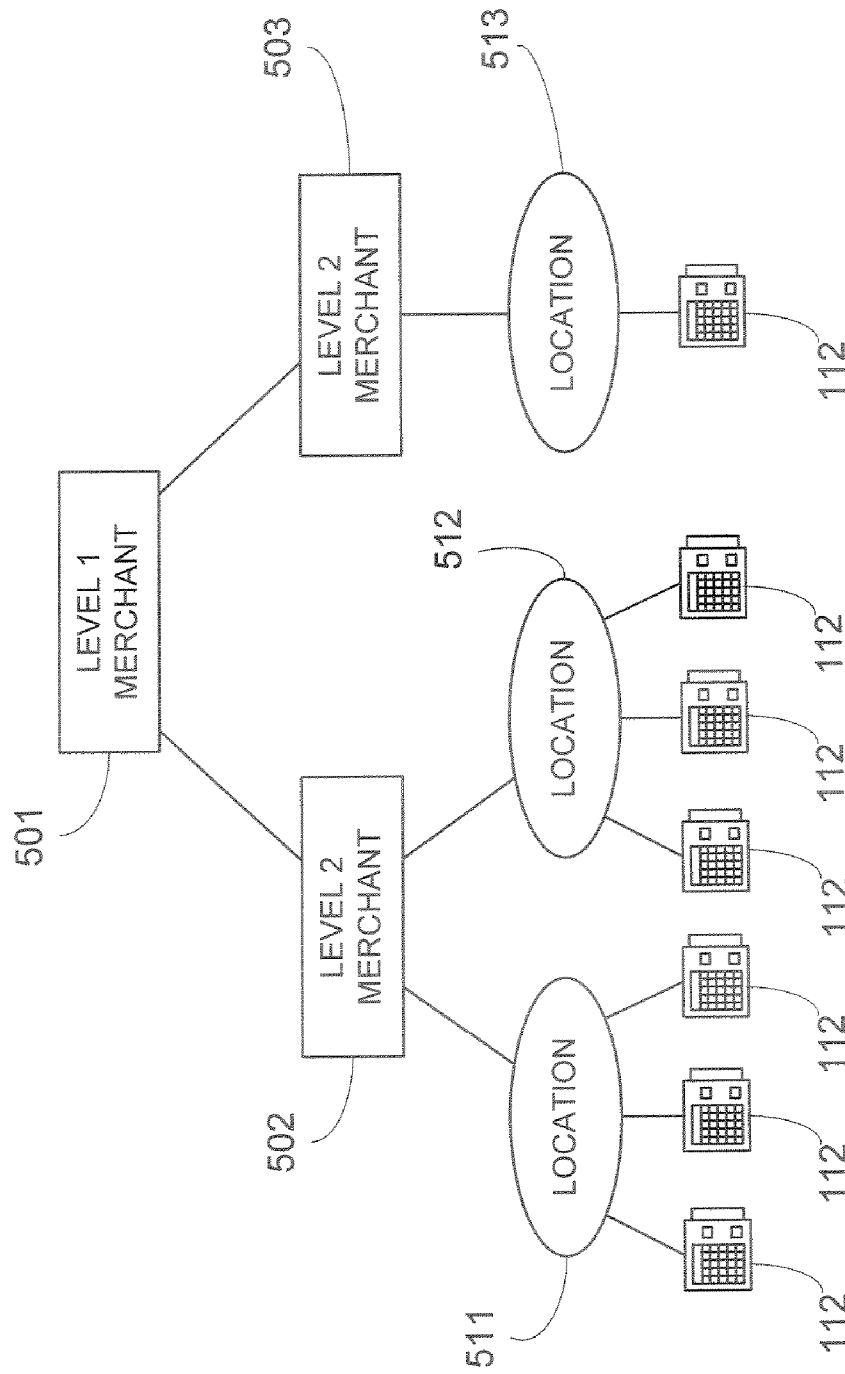


FIG. 5

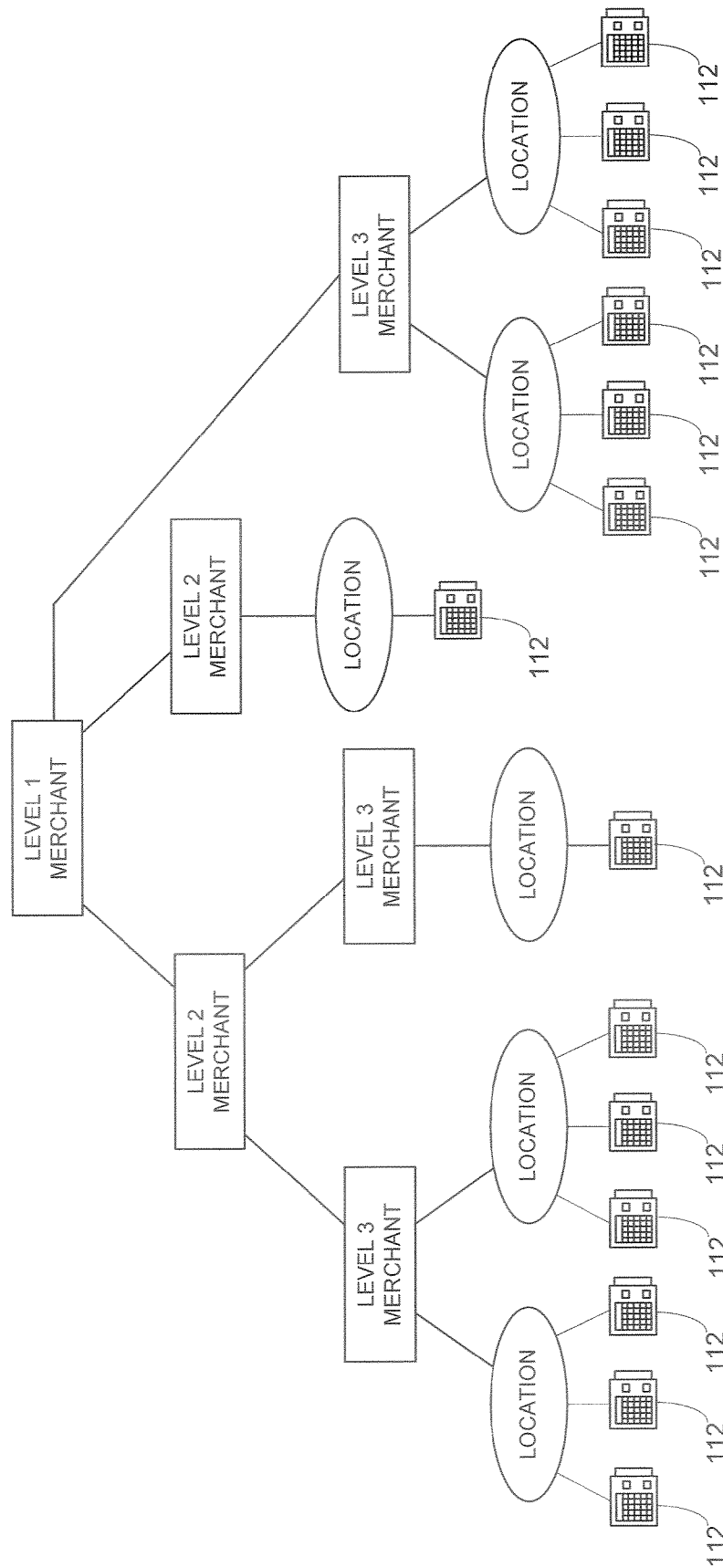


FIG. 6



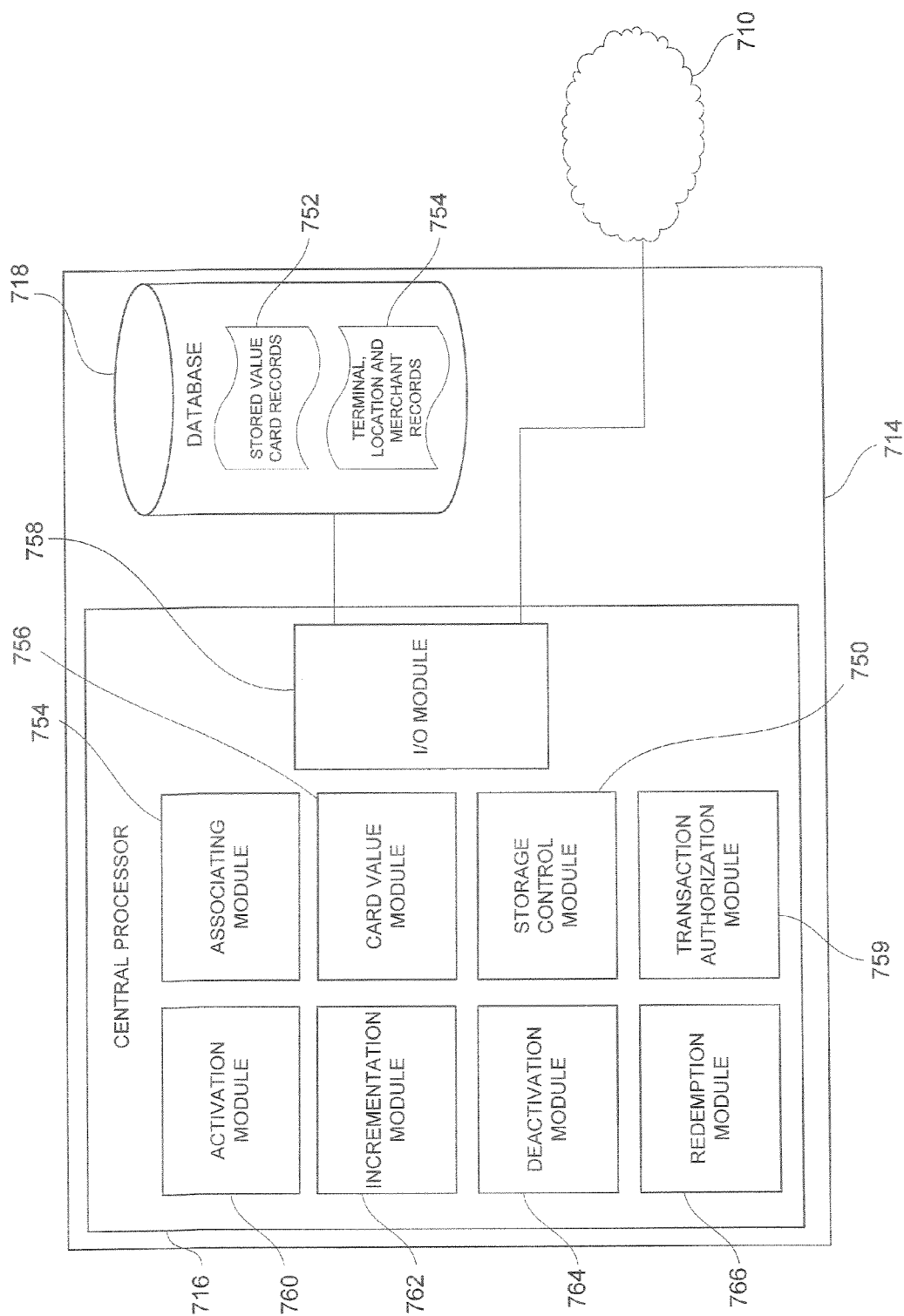


FIG. 7

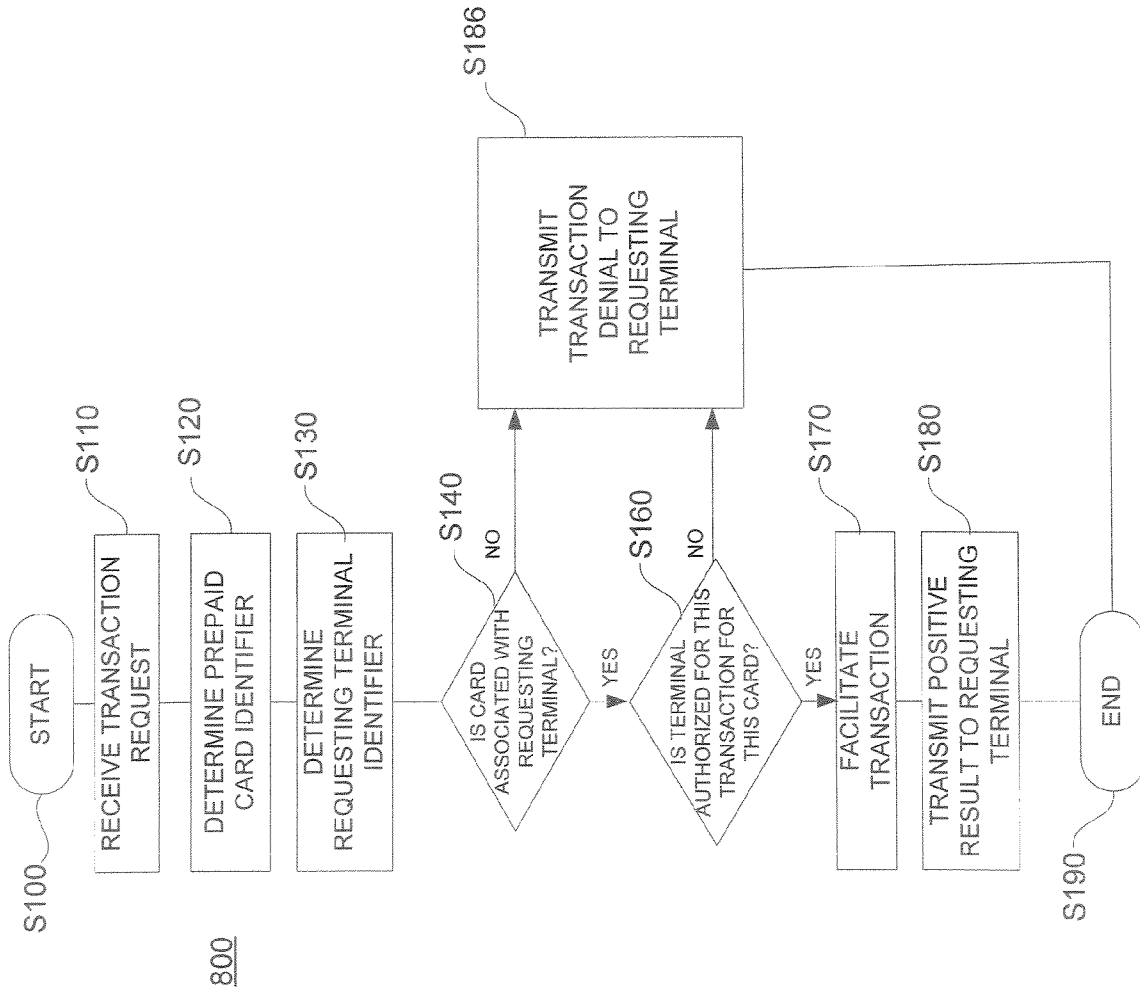
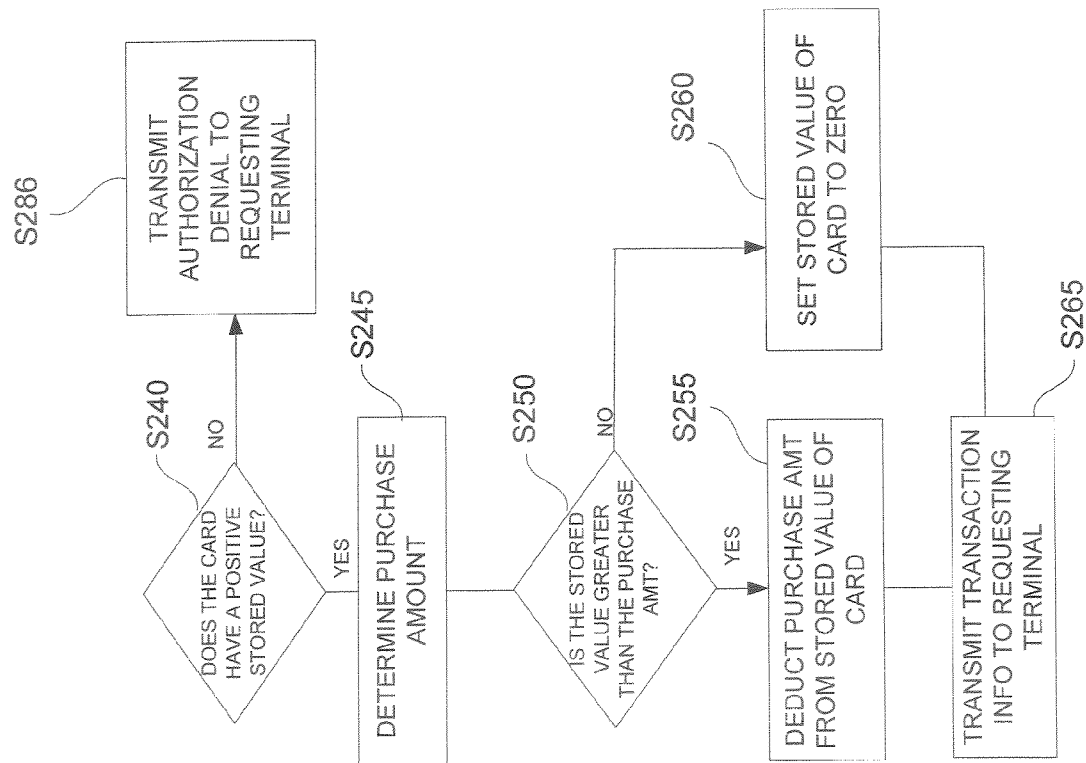


FIG. 9



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**SYSTEM AND METHOD FOR AUTHORIZING  
STORED VALUE CARD TRANSACTIONS****RELATED APPLICATIONS**

This application is a continuation-in part of U.S. application Ser. No. 10/655,828, filed Sep. 5, 2003, which is a continuation-in-part of U.S. application Ser. No. 10/411,971, filed Apr. 11, 2003, now U.S. Pat. No. 7,083,084, which is a continuation of U.S. application Ser. No. 09/641,363 filed Aug. 18, 2000, now U.S. Pat. No. 6,575,361, which claims priority to U.S. Provisional Application No. 60/149,740 filed Aug. 19, 1999, all of which are incorporated herein by reference in their entirety.

The application is related to U.S. application Ser. No. 10/698,084, filed Nov. 3, 2003, now U.S. Pat. No. 7,028,891, U.S. application Ser. No. 10/732,641, filed Dec. 10, 2003, now U.S. Pat. No. 7,093,761, and U.S. application Ser. No. 10/712,812, filed Nov. 13, 2003, now U.S. Pat. No. 7,168,615, all of which are continuations-in-part of U.S. application Ser. No. 10/411,971, filed Apr. 11, 2003, now U.S. Pat. No. 7,083,084, and U.S. application Ser. No. 10/253,243, filed on Sep. 24, 2002, which claims priority to U.S. Provisional Application Nos. 60/396,404 filed Jul. 15, 2002 and 60/324,333 filed Sep. 24, 2001, all of which are incorporated herein by reference in their entirety.

The application is also related to U.S. application Ser. No. 10/831,922, filed Apr. 26, 2004, now U.S. Pat. No. 6,918,537, which is incorporated herein by reference in its entirety.

**BACKGROUND OF THE INVENTION**

The present invention relates, generally, to remote data management, and, more particularly, to management of stored-value card data. In general, stored-value card data is information relating to services and/or products the cost of which has been prepaid by the owner or end user of the card. Examples of prepaid services that may be accommodated by a stored-value card include long distance telephone communication, wireless communication, paging and internet-enabled communication services, including wireless web access, emergency road service, legal service, accounting service, tax service, property cleaning and/or maintenance service, clothes cleaning service, transportation service, travel service, delivery service, online (or off-line) dating service, electrical and/or gas service, water service, sewage service, internet access, and film processing (including digital film processing). Other examples of stored-value or prepaid cards include gift cards, prepaid gas cards, prepaid grocery cards, prepaid entertainment cards, prepaid movie cards, downloadable ring tone cards, downloadable game cards, downloadable movie cards, downloadable music cards that use MP3, MP4, WMV, WAV, or other music formats, any other downloadable software card, customer rewards cards, bridge and/or road toll cards, and any other type of stored-value cards for products, services, or both, that may be prepaid by the owner of the card. Stored value cards may also be used to pay bills or to insert value into customer accounts.

The general model for stored-value cards involves a customer purchase of a card from a merchant for a face value or for a customer-determined value. Each card has an identification number that may be printed and/or magnetically stored on the card. The identification number is also stored in a file in a database maintained by the card issuer. This file is also used to store the value of the card. In the traditional business model, when the cards are sent to the retail location from which they will be sold the corresponding records in the

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database are already activated, thus allowing the card to be used immediately by a customer.

Depending on the type of card, the card may be used by physically presenting the card to a retailer at the time of purchase or, as is typically the case for telecommunications purchases, by relating the identification number and/or a personal identification number (PIN) to a service provider. For example, to use the card as a prepaid long distance card, the customer dials a toll free number to access the card issuer's system, enters the identification number, and then makes the desired long-distance call. During the call, the value of the card in the database is reduced as a function of phone charges accumulated during that call. When the value of the card is exhausted, the call terminates. If the customer ends the call before the value of the card is exhausted, the remaining value may be used for additional calls. Once the entire value of the card has been used, the card is discarded.

Preactivated card systems have several disadvantages. For example, since the cards are active while on the shelf in the retail location, the cards may be stolen by a thief and easily used. One way to address some of the drawbacks of prior art prepaid phone card systems would be to install activation terminals unique to the stored-value or prepaid card issuer. This is referred to as a "closed system." U.S. Pat. No. 5,577,109 by Stimson et al. discloses such a closed system. In the Stimson system, the cards are not preactivated. Each of the retail locations from which cards are to be sold is provided with a dedicated activation terminal which allows the retail operator to set the value of the card at the time of the sale. The activation terminal connects to the card issuer's system to pass along the value amount and to request activation of the card. Depleted cards can be recharged in the same manner as they are sold. A serious disadvantage of the Stimson system is that it requires single-function, dedicated hardware to be installed in each retail location, resulting in a very inflexible and expensive system.

It would be further desirable to provide a system that allows for selectively processing stored-value card requests, such as stored-value card activation, deactivation, and/or incrementing, based on a table of predefined codes associated with respective user groups.

**SUMMARY OF THE INVENTION**

An aspect of the invention provides a computer-implemented method for processing a stored-value card transaction request in a card data management system having a central processor in communication with a plurality of point-of-sale terminals over a communications network. Each of the one or more terminals has a unique terminal identifier and is associated with a location and a stored-value card merchant. The central processor is in communication with a database having stored therein a plurality of card records. Each card record contains data associated with a stored-value card distributed to a stored-value card merchant for further distribution to purchasers at a location controlled by the stored-value card merchant. The method comprises receiving the stored-value card transaction request from a requesting terminal, the requesting terminal being one of the plurality of point-of-sale terminals. The transaction request comprises a requesting terminal identifier, a card identifier assigned to a stored value card, and information indicative of a requested transaction type. The method further comprises determining if the requesting terminal is authorized to request the requested transaction type for the stored value card. The method still further comprises, responsive to a determination that the requesting terminal is authorized to request the requested

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transaction type, initiating the requested transaction. The method also comprises transmitting a request response to the requesting terminal.

## BRIEF DESCRIPTION OF THE DRAWINGS

FIG. 1 is a schematic representation of a stored-value card system according to an embodiment of the invention;

FIG. 2 is a schematic representation of a stored-value card system according to an embodiment of the invention;

FIG. 3 is a schematic representation of a stored-value card system according to an embodiment of the invention;

FIG. 4 is a schematic representation of a stored-value card system according to an embodiment of the invention;

FIG. 5 is a schematic representation of a merchant-location-terminal hierarchy that may be incorporated into the stored-value card systems of the invention;

FIG. 6 is a schematic representation of a merchant-location-terminal hierarchy that may be incorporated into the stored-value card systems of the invention;

FIG. 7 is a schematic representation of a card data management system for use in conjunction with embodiments of the invention;

FIG. 8 is a diagram of a method of processing a stored-value-card transaction according to an embodiment of the invention; and

FIG. 9 is a diagram of actions that may be taken in a method of processing a stored-value-card redemption transaction according to an embodiment of the invention.

Before any embodiment of the invention is explained in detail, it is to be understood that the invention is not limited in its application to the details of construction and the arrangements of components set forth in the following description or illustrated in the drawings. The invention is capable of other embodiments and of being practiced or being carried out in various ways. Also, it is to be understood that the phraseology and terminology used herein is for the purpose of description and should not be regarded as limiting.

## DETAILED DESCRIPTION OF EXEMPLARY EMBODIMENTS

## Glossary

**Customer/Distributor.** A customer/distributor is a customer of the assignee of the present invention who performs the role of distributor by managing a set of stored-value cards and subordinate entities that use the stored-value card data management system of the present invention.

**Merchant.** A merchant is a stored-value card-selling business unit or business chain that can be subordinate to other merchants, or have other merchants subordinate to it. An arbitrary number of hierarchy levels and branching complexity can be supported at the merchant level. In one illustrative embodiment, the database is implemented to support up to eight merchant levels in order to conveniently halt excessive tree recursion in the case of circular or lost dependencies. It will be appreciated, however, that each database element may be designed to permit the number of levels to be extended beyond eight by the change of a single parameter in any given element.

**Location.** A location is a business unit, typically, but not exclusively, a single physical store, directly subordinate to a single merchant. A location has one or more terminals that may be used for submitting stored-value card activation or redemption requests. Locations with terminals authorized for card activation are referred to as activation locations while

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locations with terminals authorized for card redemption are referred to as redemption locations. As used herein, the term "location" does not necessarily refer to a unique geographic location. It is, instead, a way of describing a particular group of terminals that are typically, but not necessarily, located in a particular geographic location (e.g., a retail outlet).

**Terminal.** A terminal is a physical credit or debit-card terminal. Each terminal is subordinate to one and only one location. A terminal may be authorized to submit stored-value card activation requests, redemption requests or both activation and redemption requests.

## Transaction Control

The present invention provides a system for managing stored-value cards that provides control over the entities that can request activation, deactivation, reloading and redemption of stored-value cards. This control is accomplished by establishing a hierarchy of merchants, locations and terminals and allocating authorizations to the various levels. For example, the system may be adapted to communicate with a top layer of customers/distributors, an intermediate layer of one or more merchants associated with each customer/distributor, and a bottom layer of terminals distributed among various merchant locations. The system allows for controls to be established at any of these levels so that, for example, a particular merchant could be authorized to request activation, deactivation and recharging of a stored-value card while another merchant is authorized to request redemption of stored-value card value. Authorization of various functions may also be allocated to a particular set of terminals controlled by a given merchant or at a given location.

FIG. 1 illustrates a system according to an embodiment of the invention in its simplest form. In the illustrated embodiment, a stored value card system 100 comprises a single stored value card merchant 2 having a single terminal 112 assigned to a single location 4. It will be understood that the merchant 2 is subordinate to a particular distributor of stored value cards. In this example and in those that follow, the distributor layer at the top of the hierarchy is omitted for simplicity of illustration. The terminal 112 is in communication with a data management system 114 comprising a central processor 116 and a database 118. As will be discussed in more detail hereafter, the central processor 116 is configured for receiving stored-value card transaction requests from one or more terminals, determining authorization for the requested transactions, and processing and storing stored-value card data in card data records stored in the database 118.

The terminal 112 is typically positioned at the prepaid card point-of-sale and is configured for reading or otherwise receiving data from stored-value cards distributed by card distributor to one or more stored-value card merchants. Each card carries information printed and/or encoded (e.g., on a magnetic stripe) on the card. This information typically includes an identifier unique to the particular card. As will be discussed hereafter, this card identifier may be used to associate prepaid value and other data with the card in a card record. The stored-value card is analogous to a valid credit or debit card, with no monetary value until activated. Although stored-value cards are typically made of plastic or other light and durable material and are the size of a credit card, they may be of virtually any material and geometry.

The terminal 112 may be configured with a card reader mechanism for reading the printed or encoded indicia on the stored-value card. Alternatively or in addition, the terminal 112 may be configured for manual entry of card information.

The terminal 112 is further configured to transmit a transaction request over the communications network 110. A



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transaction request may be a request to activate a card as part of a customer purchase of the card, a request to deactivate a card, a request to add value to (recharge) a card, and a request to redeem the value of the card as part of a service or merchandise purchase by a card user. Any terminal **112** is capable of transmitting any of these request types. However, as will be discussed, the central processor **116** will complete the requested transaction only if the terminal **112** is authorized for that request type. The terminal **112** typically has terminal identification information that can be used to distinguish it from other terminals that may communicate with the data management system **114**. Some or all of this information may be used as a terminal identifier in communications between the terminal **112** and the central processor **116**. As used herein, "terminal identifier" means information sufficient to distinguish a particular terminal from other terminals capable of communicating with a central processor. The terminal identifier may include, by way of example only, an electronic signature or a unique identification code. The terminal identifier may alternatively be a combination of terminal and location or retailer information. For example, a terminal may have assigned to it an identification code that is unique only for a particular location or retailer, but when provided in combination with a location or retailer code, uniquely identifies the terminal. The terminal identifier may be transmitted to the central processor **116** along with all transaction requests.

The communications network **110** may be any network such as a phone network, credit or debit card network, the Internet, an intranet, etc., over which credit or debit card transactions may be carried out. The network **110** may be a host-to-host network or may, as illustrated, make use of transaction network that routes the requests to the data management system **114** via a host bank **120**. An example of this type of network would be the Visa network.

As noted above, the systems of the invention provide for transaction request authorization at multiple levels of the card merchant hierarchy. This is accomplished by (1) maintaining records of the locations associated with each card merchant and the terminals associated with each location and (2) establishing authorization for each transaction type for each level. In the simple hierarchy of the card system **100** of FIG. 1, however, the stored value card merchant **2** has only a single terminal **112** assigned to a single location **4**. Thus, the merchant **2**, the location **4** and the terminal **112** will all have the same authorization.

In an exemplary scenario, the card merchant **2** may be authorized for activation, deactivation and recharge of stored-value cards provided to the card merchant **2** by a distributor. The central processor **116** will maintain records in the database **118** that associate these authorizations with the location **4** and/or the terminal **112** for the specific cards provided to the merchant **2**. If the central processor **116** receives from the terminal **110** a request to activate one of these cards, it will verify the authorization and facilitate the transaction. If, however, the central processor **116** receives from the terminal **110** a request to redeem the value of that same card, it will deny the request because the terminal **110** is not authorized to request redemption. This scenario would be typical for prepaid cards for telecommunication or other services that are sold by a retail outlet that is not directly affiliated with the service provider. It would also be representative of instances where a stored-value card sold by one retailer is redeemable for purchases only from another retailer.

In another exemplary scenario, the card merchant **2** may be authorized for redemption only. In this scenario, only

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requests for redemption received from the terminal **110** will be carried out by the central processor. Any other transaction requests will be denied.

In the system **100** illustrated in FIG. 1, the data management system **114** will handle only the transaction requests authorized for the merchant **2**. Those transactions that are not authorized may not be carried out through the card management system **114**. For example, if the stored-value cards sold by the card merchant **2** are intended to be redeemed by another card merchant, the redemption transaction is not carried out by the data management system **114** because the second card merchant is not included in the system **100**. FIG. 2 illustrates a stored-value card system **200** that is similar to the previously described system except that a second merchant **103** is added. The second merchant **103** also has a single terminal **112b** allocated to a single location **113**. The terminal **112b** of the second merchant **103** may be substantially identical to the terminal **112a** of the first merchant **102** with the exception of its unique identifier. The terminal **112b** may also be configured for communication over the same network **110**.

Either or both of the merchants **102**, **103** in the card system **200** may be provided stored-value cards by the distributor and either or both of the merchants **102**, **103** may be given transaction authorizations for its own cards and/or those of the other merchant. Following the first of the earlier-described scenarios, the first merchant **102** may be granted authorization only to activate, deactivate and recharge a plurality of cards provided to it by a distributor. This authorization is associated by the central processor **116** with the terminal **112a** allocated to the location **111** of the first merchant **102**. The second merchant **103** may be granted authorization to redeem the cards provided to the first merchant **102**. This is accomplished by associating the authorization of the location **113** and/or the terminal **112b** of the second merchant **103** with the appropriate card records stored in the database **118**.

It will be understood that the second merchant **103** may or may not be provided cards of its own by the distributor. If it is provided with cards, it will be provided separate authorizations for these cards that are independent of the authorizations for the cards distributed to the first merchant **102**. It can thus be seen that cards that are redeemable only at the second merchant **103** could be sold by both merchants **102**, **103**.

FIG. 3 illustrates another two merchant system. In the stored-value card system **300** of FIG. 3, however, the first and second merchants **112**, **113** each have a plurality of terminals **112** allocated to their single locations **111**, **113**. The terminals **112** may all be substantially identical with the exception of their unique identifiers. Operation of the system **300** may be substantially identical to the system **200** except that there is now an opportunity for variations in authorization within the hierarchy of each merchant. Specifically, the terminals **112** of the first merchant **102** need not all be given the same authorizations. For example, all three of the terminals **112** of the first merchant **102** may be authorized to request activation and recharge transactions but only one (e.g., a terminal at a customer service counter) may be authorized to request a deactivation request. Similarly, the terminals **112** of the second merchant **103** may be divided so that two are authorized for redemption, but only one is authorized for activation.

In the card system **300**, variations in authorization must be tied to specific terminals in the card records in the database **118**. The authorization for the two single locations **111**, **113** will be identical to the authorization of their respective merchants **102**, **103**. FIG. 4 illustrates another card system variation where this is not necessarily the case. The stored-value card system **400** of FIG. 4 illustrates an embodiment where the first and second merchants **102**, **103** each have more than

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one location **111**, **113**. In this embodiment, each location **111**, **113** may be allocated its own set of authorizations. For example, one of the locations **111** of the first merchant **102** may be authorized to request activation, deactivation and recharge, while the other location **111** is only authorized to conduct activation and recharge. In another example, one of the locations **113** of the second merchant **103**, may be authorized to request activation, deactivation and recharge, while the other location **113** is authorized for activation, deactivation recharge and redemption.

The authorization of each location **111**, **113** may be associated with the appropriate card records in the database **118** by the central processor **116**. It will be understood that location level authorizations may be allocated in total to individual terminals **112** of each location or may be subdivided as described above for the card system **300**.

FIGS. **5** and **6** illustrate additional merchant hierarchies that may be accommodated by the stored-value card systems of the invention. Although the network and data management system are omitted from these illustrations, it will be understood that their interaction with the hierarchy constituents and, in particular, the terminals **112**, is substantially similar to the previously described system embodiments. FIG. **5** illustrates a hierarchy having more than one merchant level. Specifically, a single first level merchant **501** is positioned over two second level merchants **502**, **503**. The first of the second level merchants **502** has two locations **511**, **512**, each having three terminals **112**. The second of the second level merchants **503** has a single location **513** with a single terminal **112**. The stored-value card systems of the invention provide the capability to allocate authorizations at any of the four layers shown in this hierarchy. For example, the first level merchant **501** may be given a set of authorizations for all transaction requests for cards distributed directly to it or to the second level merchants. The second level merchants **502**, **503** may each be separately allocated any one or more of the authorizations allocated to the first level merchant **501**. Each of the second level merchants **502**, **503** may similarly allocate any one or more of its authorizations to its locations **511**, **512**, **513** and so on.

FIG. **6** illustrates an even more complex hierarchy that may be accommodated by the card systems of the invention. This hierarchy has as many as five authorization levels. As in the hierarchy of FIG. **5**, every entity may have any or all of the authorizations assigned to the entity above it. The authorizations of any given terminal **112** at the bottom level are limited by the authorizations of each entity in the chain between that terminal **112** and the first level merchant at the top.

The merchants and terminals of any hierarchy can be divided into groups for the purpose of carrying out certain actions. Certain hierarchy constituents may be grouped, for example, for the purposes of billing, commission payment, reporting, inventory management, etc. Otherwise loosely related entities may also be grouped for purposes of transaction authorization. For example, terminal A from Merchant X and terminal B from merchant Y may both be members of Group A-1, the members of which all have the same authorizations, yet for billing purposes, terminal A may be in billing group B-1 and terminal B is in billing group B-2. Management and definition of these groups may be accomplished by the central processor, which will maintain all associations in the database along with the terminal authorizations.

#### Card Data Management System

As discussed above, each of the stored-value card systems of the invention is managed through a data management system in communication with the card system's point-of-sale

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terminals. An illustrative data management system **714** that may be used in conjunction with the stored-value card systems of the invention is illustrated in FIG. **7**. The data management system **714** comprises a central processor **716** and a database **718**. The central processor **716** and the database **718** may reside on a single data processor or multiple processors interconnected by a network. The central processor **716** may itself comprise multiple processors any or none of which may be located with each other or with the database **718**.

The central processor **716** comprises a series of modules adapted for managing stored-value card data records and transaction authorization records stored in the database and for receiving and responding to transaction requests received from point-of-sale terminals. As shown in FIG. **7**, these modules may include a storage control module **750** that allows for storing in the database **718** a plurality of card records **752** comprising stored-value card data for each stored-value card. The stored-value card data may include information such as an active/inactive bit to indicate the status of the card, the stored value of the card, and identifiers associating the card with particular merchants, locations and terminals and their associated authorizations. The card data may also include transaction information relating to one or more past transactions. For example, the card data may include information such as the date and time of activation and the terminal from which the activation request was received. The card data could also maintain similar information from the last transaction processed.

The storage control module **750** may also be adapted for storing in the database **718** records regarding the merchant location/terminal hierarchies and associated authorizations. For example, the database **718** may have stored therein a terminal record for each terminal, a location record for each location and a merchant record for each merchant for which card data are being managed by the data system **714**. A terminal record may, for example, include the unique terminal identifier associated with the terminal and a location identifier associated with the location to which the terminal is allocated. A location record may include the location identifier for the associated location, a merchant identifier associated with the merchant controlling the location, and any other information that may be desirable for monitoring and management functions of the system. A merchant record may include the merchant identifier of the associated merchant, an identifier for any parent entity to which the merchant is subordinate and any other information that may be desirable for monitoring and management functions of the system.

An associating module **754** is adapted for associating each stored-value card with the terminal identifiers of terminals authorized to request transactions for that card. The associating module **754** may receive these identifiers in several ways. One way is through the use of set-up cards. Setup cards are uniquely coded terminal-readable cards that may be used to associate terminals and locations with a particular set of stored-value cards. The set-up card code/identifier may be read at a particular terminal (e.g., by swiping a magnetic strip on the card) to be associated and transmitted to the central processor **716** along with the terminal identifier. The transmission is received at the central processor **716** and passed to the associating module **754** via an input/output module **758**.

Each set-up card may be associated with a particular set of authorizations and particular merchant hierarchy elements. In an example scenario, a set-up card may be associated with a particular location and with the transaction authorizations for activation, deactivation and incrementation (recharge). When the set-up card is read by a terminal at the particular location, the terminal transmits its identifier and the set-up card iden-

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tifier. The associating module **754** receives the transmission and creates the association between the terminal and the stored-value cards distributed to the location. The authorizations are also stored so that the cards of that location may only be activated, incremented or deactivated using that particular terminal. Redemption requests submitted by the terminal will be rejected.

As an alternative to the use of a set-up card, terminal identifiers may be separately transmitted to the central processor **716** in a data file. The file may be set up to include only the identifiers for terminals associated with a particular location and authorization set or may include information linking different groups of terminals to location identifiers and authorization combinations. The data file may be received from a merchant or a location over a network such as the Internet.

Terminal identifiers may also be manually entered into the data processor **716** by the stored-value card system administrator or by a merchant via an interface available over the Internet.

Once the terminal identifiers have been received, the associating module **754** may create an association between each terminal identifier and some or all of the cards distributed to the location of the terminal. This association may be recorded through the addition of the terminal identifier to the card record of each such card. The related authorization for the terminal relative to the card may also be added to the card record or stored separately.

The central processor may also comprise a value module **756** adapted to establish an initial value in each respective stored-value card. This initial value may reflect a predetermined "face value" that is established at the time the card record is initially created but is inactive until the card is activated. The card value could be a monetary amount could comprise other product or service-related units. For example, a prepaid telecommunications card could have a value denominated in time units. A prepaid music download card could have a value denominated in numbers of downloads. The value module **756** may also be adapted to work in conjunction with the transaction modules to establish and store an updated card value after a transaction has been processed.

The central processor **714** further includes an input/output module **758** in communication with one or more networks **710** over which the input/output module **758** may receive communication from point-of-sale terminals. The input/output module **758** may be configured for receiving transaction requests from such terminals and passing them to the appropriate transaction processing module. The input/output module **758** may also be configured for communicating a response to the transaction request back to the requesting terminal over the network **716**. Each transaction request may include a terminal identifier, a stored-value card identifier and a transaction type indicator. Other information may be included depending on the type of transaction. For example, a redemption request may include the price of the product or service for which the stored value associated with a stored-value card is being redeemed. A response to a transaction request may include a positive transaction indicator (indicating a completed transaction) or a negative transaction indicator (indicating a denial of completion). A negative response may include a reason for denial. A positive response may include information related to the transaction such as the stored value of the stored-value card.

The input/output module **758** may transfer transaction requests to a transaction authorization module **759** configured for determining whether the terminal submitting a particular transaction request is authorized to do so. This determination may be accomplished by determining whether the terminal

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identifier in the request matches an authorized terminal identifier associated with the stored-value card and, if so, whether the associated terminal is authorized for the transaction type. The association between authorized terminal identifiers and a stored value card may be established in a variety of forms including by storing the authorized terminal identifiers in the card record itself or by storing a link to a separate record for the authorized terminal identifiers. The association may also include an indirect link through a merchant or location identifier.

Once the validity of a transaction request has been established, the transaction may be processed by one of a series of transaction modules. These may include, but are not limited to, an activation module **760**, an incrementation module **762**, a deactivation module **764**, and a redemption module **766**. The activation module **760** is configured to change the status of the appropriate card record to active. The incrementation module **762** is configured to add an incremental value to the value of the appropriate card record. The deactivation module **764** is configured to change the status of the appropriate card record to inactive. The redemption module **766** may be configured to determine whether the stored-value card has a stored value greater than the amount of the product or service purchase. It may also be configured to determine and store a post-transaction value for the card.

The central processor **716** of the card data management system **714** may be adapted to enable a web-based, ID-and-password-protected management application available to anyone with Internet access and the appropriate ID and Password. The system **714** may further comprise a reporting engine that allows for generating reports for sales analysis, inventory control and billing. The system **714** may still further comprise a trouble-shooting interface with visibility into each transaction, card, location, terminal and merchant. In operation, the system may use an automated card replenishment system that tracks unactivated card inventory at all locations and transmits an alert when the inventory falls below a predefined level.

#### Transaction Request Processing

FIG. **8** illustrates an exemplary method **800** of processing a stored-value card transaction request in a stored-value card system in which a plurality of cards have been distributed to one or more merchant locations each having one or more point-of-sale card-reading terminals. The method **800** begins at **S100** and at **S110** an activation request is received. As discussed above, the content of the transaction request may depend on the type of transaction, but will generally include an indication of the transaction type, the terminal identifier, and the stored-value card identifier. At **S120** and **S130**, the stored-value card identifier and the terminal identifier, respectively, are determined from the transaction request.

At **S140**, a determination may be made as to whether the stored-value card identified in the request is associated with the requesting terminal. As discussed above, the card data management systems of the invention each have a database of card records in which are stored information relating to distributed stored-value cards. Each of these card records may be associated with a set of terminals authorized to request transactions for a particular stored-value card. Information associating the card record and the identifiers of the authorized terminals is stored in the database. This information could be a list of the identifiers or it could be a location or merchant identifier that could be used to link to a list of terminals owned or controlled by the identified merchant or located at the identified location. Thus, the action **S140** may include comparing the requesting terminal identifier to a specific list of



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authorized terminal identifiers associated with the card record. The associated list could even be stored in the card record itself. In some variations of the method **800**, the action **S140** may include determining the location or merchant associated with the requesting terminal, then determining whether the stored-value card was distributed to that particular card or merchant. The action **S140** could also include comparing the requesting terminal identifier to an authorized subset of merchant or location terminals.

If the terminal identifier is not associated with the stored-value card, a denial is transmitted to the terminal at **S186** and the method ends. If the terminal identifier is associated with the stored-value card a determination as to whether the terminal is authorized to request the current transaction type may be made at **S160**. This may be accomplished by checking the transactions associated with the terminal for this stored-value card. If the transaction is not authorized for this terminal for this card, a denial is transmitted to the terminal at **S186** and the method ends. If the transaction is authorized, the transaction is processed at **S170** and a positive request result is transmitted to the requesting terminal at **S180**. The positive request result may include information specific to the transaction requested. For example, the positive request result may include an updated value for the stored value card. The method ends at **S190**.

FIG. 9 illustrates some additional actions that may be added to the method **800** when the requested transaction is for stored-value card redemption. Some or all of these actions may be included as part of **S170** is the method **800**. The additional actions may include at **S240** determining whether the stored-value card has a positive stored value. If it does not a transaction denial is issued at **S286** and the method ends. If the stored-value card has a positive value, the method continues. The method **800** may include determining the purchase amount from the redemption request at **S245**. At **S250**, a determination may be made as to whether the stored value for the card is greater than the purchase amount. If it is not, the method may carry out one of several alternatives. In one alternative, the available value of the stored-value card may be applied to the purchase and a positive transaction result returned. This is illustrated in FIG. 9, which shows at **S260**, setting the card value to zero and transmitting transaction information to the requesting terminal at **S265**. Such information could be transmitted along with a positive transaction result. Another alternative would be to transmit a transaction denial with a message that the purchase exceeds the value of the card. This could require that the request be resubmitted for an amount no greater than the available value of the card.

If the stored value for the card is greater than the purchase amount, the purchase amount may be deducted from the stored value at **S255**. Transaction information may then be transmitted at **S265** with a positive transaction result.

#### General Implementation

General aspects of possible implementation of the inventive technology will now be described. Various method and operating system embodiments of the inventive technology are described above. It will be appreciated that the systems of the invention or portions of the systems of the invention may be (or be implemented on) a "processing machine" such as a general purpose computer, for example. As used herein, the term "processing machine" is to be understood to include at least one processor that uses at least one memory. The at least one memory stores a set of instructions. The instructions may be either permanently or temporarily stored in the memory or memories of the processing machine. The processor executes the instructions that are stored in the memory or memories in

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order to process data. The set of instructions may include various instructions that perform a particular task or tasks, such as those tasks described above in the flowcharts. Such a set of instructions for performing a particular task may be characterized as a program, software program, or simply software.

As noted above, the processing machine executes the instructions that are stored in the memory or memories to process data. This processing of data may be in response to commands by a user or users of the processing machine, in response to previous processing, in response to a request by another processing machine and/or any other input, for example.

As previously discussed, the processing machine used to implement the invention may be a general purpose computer. However, the processing machine described above may also utilize any of a wide variety of other technologies including a special purpose computer, a computer system including a microcomputer, mini-computer or mainframe for example, a programmed microprocessor, a micro-controller, a peripheral integrated circuit element, a CSIC (Customer Specific Integrated Circuit) or ASIC (Application Specific Integrated Circuit) or other integrated circuit, a logic circuit, a digital signal processor, a programmable logic device such as a FPGA, PLD, PLA or PAL, or any other device or arrangement of devices that is capable of implementing the steps of the process of the invention.

It will be understood that in order to practice the methods of the invention as described above, it is not necessary that the processors and/or the memories of the processing machine be physically located in the same geographical place. That is, each of the processors and the memories used in the invention may be located in geographically distinct locations and connected so as to communicate in any suitable manner. Additionally, It will be understood that each of the processor and/or the memory may be composed of different physical pieces of equipment. Accordingly, it is not necessary that a processor be one single piece of equipment in one location and that the memory be another single piece of equipment in another location. That is, it is contemplated that the processor may be two pieces of equipment in two different physical locations. The two distinct pieces of equipment may be connected in any suitable manner. Additionally, the memory may include two or more portions of memory in two or more physical locations.

To explain further, processing as described above is performed by various components and various memories. It will be understood, however, that the processing performed by two distinct components as described above may, in accordance with a further embodiment of the invention, be performed by a single component. Further, the processing performed by one distinct component as described above may be performed by two distinct components. In a similar manner, the memory storage performed by two distinct memory portions as described above may, in accordance with a further embodiment of the invention, be performed by a single memory portion. Further, the memory storage performed by one distinct memory portion as described above may be performed by two memory portions.

Further, various technologies may be used to provide communication between the various processors and/or memories, as well as to allow the processors and/or the memories of the invention to communicate with any other entity, i.e., so as to obtain further instructions or to access and use remote memory stores, for example. Such technologies used to provide such communication might include a network, the Internet, Intranet, Extranet, LAN, an Ethernet, a telecommunica-

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tions network (e.g., a cellular or wireless network) or any client server system that provides communication, for example. Such communications technologies may use any suitable protocol such as TCP/IP, UDP, or OSI, for example.

As described above, a set of instructions is used in the processing of the invention. The set of instructions may be in the form of a program or software. The software may be in the form of system software or application software, for example. The software might also be in the form of a collection of separate programs, a program module within a larger program, or a portion of a program module, for example. The software used might also include modular programming in the form of object oriented programming. The software tells the processing machine what to do with the data being processed.

It will be understood that the instructions or set of instructions used in the implementation and operation of the invention may be in a suitable form such that the processing machine may read the instructions. For example, the instructions that form a program may be in the form of a suitable programming language, which is converted to machine language or object code to allow the processor or processors to read the instructions. That is, written lines of programming code or source code, in a particular programming language, are converted to machine language using a compiler, assembler or interpreter. The machine language is binary coded machine instructions that are specific to a particular type of processing machine, i.e., to a particular type of computer, for example. The computer understands the machine language.

Any suitable programming language may be used in accordance with the various embodiments of the invention. Illustratively, the programming language used may include assembly language, Ada, APL, Basic, C, C++, C#, COBOL, dBase, Forth, Fortran, Java, Modula-2, Pascal, Prolog, REXX, Visual Basic, and/or JavaScript, for example. Further, it is not necessary that a single type of instructions or single programming language be utilized in conjunction with the operation of the system and method of the invention. Rather, any number of different programming languages may be utilized as is necessary or desirable.

Also, the instructions and/or data used in the practice of the invention may utilize any compression or encryption technique or algorithm, as may be desired. An encryption module might be used to encrypt data. Further, files or other data may be decrypted using a suitable decryption module, for example.

As described above, the invention may illustratively be embodied in the form of a processing machine, including a computer or computer system, for example, that includes at least one memory. It is to be appreciated that the set of instructions, i.e., the software for example, that enables the computer operating system to perform the operations described above may be contained on any of a wide variety of media or medium, as desired. Further, the data that is processed by the set of instructions might also be contained on any of a wide variety of media or medium. That is, the particular medium, i.e., the memory in the processing machine, utilized to hold the set of instructions and/or the data used in the invention may take on any of a variety of physical forms or transmissions, for example. Illustratively, the medium may be in the form of paper, paper transparencies, a compact disk, a magnetic stripe, a laser card, a smart card, a processor chip, a memory chip, a DVD, an integrated circuit, a hard disk, a floppy disk, an optical disk, a flash memory card, a magnetic tape, a RAM, a ROM, a PROM, a EPROM, a wire, a cable, a fiber, communications channel, a satellite transmissions or

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other remote transmission, as well as any other medium or source of data that may be read by the processors of the invention.

Further, the memory or memories used in the processing machine that implements the invention may be in any of a wide variety of forms to allow the memory to hold instructions, data, or other information, as is desired. Thus, the memory might be in the form of a database to hold data. The database might use any desired arrangement of files such as a flat file arrangement or a relational database arrangement, for example.

In the system and method of the invention, a variety of "user interfaces" may be utilized to allow a user to interface with the processing machine or machines that are used to implement the invention. As used herein, a user interface includes any hardware, software, or combination of hardware and software used by the processing machine that allows a user to interact with the processing machine. A user interface may be in the form of a dialogue screen for example. A user interface may also include any of a mouse, touch screen, keyboard, telephone (landline, cellular or wireless) voice reader, voice recognizer, dialogue screen, menu box, list, checkbox, toggle switch, a pushbutton or any other device that allows a user to receive information regarding the operation of the processing machine as it processes a set of instructions and/or provide the processing machine with information. Accordingly, the user interface is any device that provides communication between a user and a processing machine. The information provided by the user to the processing machine through the user interface may be in the form of a command, a selection of data, or some other input, for example.

As discussed above, a user interface is utilized by the processing machine that performs a set of instructions such that the processing machine processes data for a user. The user interface is typically used by the processing machine for interacting with a user either to convey information or receive information from the user. However, it should be appreciated that in accordance with some embodiments of the system and method of the invention, it is not necessary that a human user actually interact with a user interface used by the processing machine of the invention. Rather, it is contemplated that the user interface of the invention might interact, i.e., convey and receive information, with another processing machine, rather than a human user. Accordingly, the other processing machine might be characterized as a user. Further, it is contemplated that a user interface utilized in the system and method of the invention may interact partially with another processing machine or processing machines, while also interacting partially with a human user.

It will be readily understood by those persons skilled in the art that the present invention is susceptible to broad utility and application. Many embodiments and adaptations of the present invention other than those herein described, as well as many variations, modifications and equivalent arrangements, will be apparent from or reasonably suggested by the present invention and foregoing description thereof, without departing from the substance or scope of the invention.

While the foregoing illustrates and describes exemplary embodiments of this invention, it is to be understood that the invention is not limited to the construction disclosed herein. The invention can be embodied in other specific forms without departing from the spirit or essential attributes.

What is claimed is:

1. A computer-implemented method for processing a stored-value card transaction request in a card data management system having a central processor in communication

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with a plurality of point-of-sale terminals over a communications network, each of the one or more terminals having a unique terminal identifier and being associated with a location and a prepaid card merchant, the central processor being in communication with a database having stored therein a plurality of card records, each card record containing data associated with a stored-value card distributed to a prepaid card merchant for further distribution to purchasers at a location controlled by the prepaid card merchant, the method comprising:

receiving the stored-value card transaction request from a requesting terminal, the requesting terminal being one of the plurality of point-of-sale terminals, the transaction request comprising  
 a requesting terminal identifier,  
 a card identifier assigned to a stored value card, and  
 information indicative of a requested transaction type;  
 determining if the requesting terminal is authorized to request the requested transaction type for the stored value card;  
 responsive to a determination that the requesting terminal is authorized to request the requested transaction type, initiating the requested transaction; and  
 transmitting a request response to the requesting terminal.

2. A computer-implemented method according to claim 1 wherein the requested transaction type is one of the group consisting of card activation, card value incrementation, card deactivation, and card value redemption.

3. A computer-implemented method according to claim 1 further comprising the action of:  
 associating in the database a set of authorized terminal identifiers with the stored-value card.

4. A computer-implemented method according to claim 3 wherein the action of determining if the requesting terminal is authorized comprises the action of:

comparing the requesting terminal identifier to the set of authorized terminal identifiers.

5. A computer-implemented method according to claim 3 further comprising the actions of:

determining criteria for authorizing terminals to request transactions for the stored value card; and  
 assembling the set of authorized terminal identifiers based on the criteria for authorizing.

6. A computer-implemented method according to claim 5 wherein the criteria for authorizing include at least one of the set consisting of a terminal location requirement, a terminal ownership requirement, and terminal affiliation with a particular merchant.

7. A computer-implemented method according to claim 3 further comprising the actions of:

associating in the database a set of one or more authorized transaction types with each authorized terminal identifier.

8. A computer-implemented method according to claim 7 wherein the action of determining if the requesting terminal is authorized further comprises the actions of:

comparing the requesting terminal identifier to the set of authorized terminal identifiers; and  
 responsive to a determination that the requesting terminal identifier matches an authorized terminal identifier, comparing the requested transaction type to the set of authorized transaction types associated with the authorized terminal identifier.

9. A computer-implemented method according to claim 1 wherein the stored-value card transaction is a card value redemption transaction and the transaction request further comprises a purchase amount.

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10. A computer-implemented method according to claim 9 wherein the card record data includes a stored value for the stored-value card and the action of initiating the requested transaction comprises:

determining from the database the stored value associated with the stored-value card;  
 determining whether the purchase amount exceeds the stored value; and  
 responsive to a determination that the purchase amount does not exceed the stored value, subtracting the purchase amount from the stored value.

11. A computer-implemented method according to claim 9 further comprising:

responsive to a determination that the purchase amount exceeds the stored value, setting the stored value to zero.

12. A system for processing a request for a stored-value card transaction for a stored-value card, the transaction request being submitted by a retailer using a point-of-sale terminal that is one of a plurality of terminals capable of communicating over a network, each terminal having a unique terminal identifier and being associated with one of a plurality of merchants, the stored-value card transaction request comprising a unique card identifier for the particular stored value card, the terminal identifier of the point-of-sale terminal, and information indicative of a requested transaction type, the system comprising:

a central processor in communication with the network, the central processor being adapted to receive the transaction request from the point-of-sale terminal;

a database in communication with the central processor, the database having stored therein a plurality of stored-value card records, each comprising a unique card identifier associated with a stored-value card distributed to one of the plurality of merchants;

an associating module in the central processor configured for associating, in the database, a set of authorized terminal identifiers with each stored-value card record;

a transaction authorization module in the central processor configured for determining, based on information in the transaction request and the database, whether the requesting terminal is authorized to request the requested transaction type; and

at least one transaction processing module in the central processor configured for processing the requested transaction responsive to a determination by the transaction authorization module that the requesting terminal is authorized to request the requested transaction type.

13. A system according to claim 12 wherein the transaction authorization module is configured to determine whether the requesting terminal is authorized by determining whether the requesting terminal identifier matches an authorized terminal identifier in the set of authorized terminal identifiers.

14. A system according to claim 12 wherein the associating module is further configured for associating, in the database, a set of one or more authorized transaction types with each authorized terminal identifier.

15. A system according to claim 14 wherein the transaction authorization module is configured to determine whether the requesting terminal is authorized by determining whether the requesting terminal identifier matches an authorized terminal identifier in the set of authorized terminal identifiers, and by comparing the requested transaction type to the set of authorized transaction types associated with the authorized terminal identifier.

16. A system according to claim 12 wherein the set of authorized terminal identifiers is based on authorization criteria comprising at least one of the set consisting of a terminal



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location requirement, a terminal ownership requirement, and terminal affiliation with a particular merchant.

17. A system according to claim 12 wherein the at least one transaction processing module includes at least one of the group consisting of a card activation module, a card value incrementation module, a card deactivation module, and a card value redemption module.

18. A system according to claim 12 further comprising:

a value module adapted to determine and store in the database, in response to a stored-value card transaction, a card value for the stored-value card of the transaction.

19. A computer program embodied in a computer-readable medium for processing a stored-value card transaction request in a card data management system having a central processor in communication with a plurality of point-of-sale terminals over a communications network, each of the one or more terminals having a unique terminal identifier and being associated with a location and a prepaid card merchant, the central processor being in communication with a database having stored therein a plurality of card records, each card record containing data associated with a stored-value card distributed to a prepaid card merchant for further distribution to purchasers at a location controlled by the prepaid card merchant, the computer program comprising instructions for performing a set of actions comprising:

receiving the stored-value card transaction request from a requesting terminal, the requesting terminal being one of the plurality of point-of-sale terminals, the transaction request comprising

a requesting terminal identifier,

a card identifier assigned to a stored value card, and information indicative of a requested transaction type;

determining if the requesting terminal is authorized to request the requested transaction type for the stored value card;

responsive to a determination that the requesting terminal is authorized to request the requested transaction type, initiating the requested transaction; and

transmitting a request response to the requesting terminal.

20. A computer program according to claim 19 wherein the requested transaction type is one of the group consisting of card activation, card value incrementation, card deactivation, and card value redemption.

21. A computer program according to claim 19 wherein the set of actions further comprises:

associating in the database a set of authorized terminal identifiers with the stored-value card.

22. A computer program according to claim 21 wherein the action of determining if the requesting terminal is authorized comprises the action of:

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comparing the requesting terminal identifier to the set of authorized terminal identifiers.

23. A computer program according to claim 21 wherein the set of actions further comprises:

determining criteria for authorizing terminals to request transactions for the stored value card; and

assembling the set of authorized terminal identifiers based on the criteria for authorizing.

24. A computer program according to claim 23 wherein the criteria for authorizing include at least one of the set consisting of a terminal location requirement, a terminal ownership requirement, and terminal affiliation with a particular merchant.

25. A computer program according to claim 21 wherein the set of actions further comprises:

associating in the database a set of one or more authorized transaction types with each authorized terminal identifier.

26. A computer program according to claim 25 wherein the action of determining if the requesting terminal is authorized further comprises the actions of:

comparing the requesting terminal identifier to the set of authorized terminal identifiers; and

responsive to a determination that the requesting terminal identifier matches an authorized terminal identifier, comparing the requested transaction type to the set of authorized transaction types associated with the authorized terminal identifier.

27. A computer program according to claim 19 wherein the stored-value card transaction is a card value redemption transaction and the transaction request further comprises a purchase amount.

28. A computer program according to claim 27 wherein the card record data includes a stored value for the stored-value card and the action of initiating the requested transaction comprises:

determining from the database the stored value associated with the stored-value card;

determining whether the purchase amount exceeds the stored value; and

responsive to a determination that the purchase amount does not exceed the stored value, subtracting the purchase amount from the stored value.

29. A computer program according to claim 28 wherein the action of initiating the requested transaction further comprises:

responsive to a determination that the purchase amount equals or exceeds the stored value, setting the stored value to zero.

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